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How is Artificial Intelligence redefining modern international marketing?

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ABSTRACT:

Due to the advancement of Artificial Intelligence and its development in the International Marketing area, specialists have now the tools to completely redefine the current understanding of branding, marketing, advertising. This paper concentrates on introducing the reader to the available AI-based tools for marketing purposes and provides an insight on how the presented solutions contribute to the modern marketing worldwide. Additionally the paper presents theoretical insights on how to effectively manage highly innovative products such as Marketing AI and how to implement them in the International Marketing strategies of corporate market agents. The theoretical part is supported with an empirical study based on two semi-structure interviews with the representatives of companies offering Marketing AI products for international corporate clients.

KEYWORDS: digital marketing, international marketing, precision marketing, marketing automation, artificial intelligence, machine learning, computer vision, knowledge technology, intelligent agents, neural networks (information technology), pattern recognition, speech recognition, image recognition, chatbots, innovation management, innovation management techniques

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List of Abbreviations and Acronyms

AI – Artificial Intelligence

ANN – Artificial Neural Networks

CEO – Chief Executive Officer

CRM-Customer Relationship Management

CT- Computed Tomography Scanning

CV - Computer Vision

DL – Deep Learning

IMT-Innovation Management Techniques

ML – Machine Learning

MRI- Magnetic Resonance Imaging

NLP – Natural Language Processing

NN – Neural Networks

PaaS – Platform as a Service R&D – Research and Development

PR – Public Relations

SaaS – Software as a Service

SEO – Search Engine Optimization

STP – Segmentation, Targeting and Positioning

VSO – Voice Search Optimization

WOM – Word-of-Mouth

X-Ray – X-radiation

1 Introduction

Nowadays, international marketing specialists are trying harder than ever to attract the attention of consumers, as the market is already overflowing with advertisements of each and every kind. The digital world offers numerous opportunities for marketers just to reach people. However, in the fast-paced world, it is crucial to find new, innovative ways to market products and services. The goal is as usual - to get noticed by potential customers and get straight to the targeted market – but the ways to achieve it have changed.

Due to the advancement of Artificial Intelligence and its development in the International Marketing area, specialists have now the tools to completely redefine the current understanding of branding, marketing, advertising. Although data-driven marketing has been a thing for decades, it has never been as easy and as accessible as it is now. The ever-growing popularity of the Internet and the increase in the use of mobile devices is generating enormous amounts of data on consumers that feed AI-based systems. (Conick, 2017)

1.1 Background of the study

For over half a century, solutions based on Artificial Intelligence (AI) have been widely introduced to a spectrum of branches like automotive or medicine. Already in the 1980s scientists knew that AI will change the way marketing strategies are planned and implemented. Their predictions were based on the evolution of marketing decision support systems at that time. (Lillis and McIvor, 1985) However, the application of Artificial Intelligence in the field of Social and Economic Sciences, precisely International Management and Marketing is rather new.

The world has been made aware of the power of AI in Marketing, as the news in 2012 have reported on Target (an American retail corporation) figuring out by accident a

female teenager was pregnant before she announced the pregnancy to her family. The retailer, based on the women's shopping habits, has started sending her advertisement of newborn necessities. At that time, people have learned that it was Target's strategy, as they have been analyzing the customer choices. Target has implemented a specially designed algorithm that enabled the retailer not only pregnancy and the baby's sex prediction but even birth date estimation. (forbes.com, 2012)

Especially in recent years, the development of AI tools for marketing practitioners has increased significantly, mostly due to the advancement of the technologies associated with AI such as Machine Learning or Computer Vision. This technological advancement and the increase of the applicability of AI in Marketing have contributed to the market size of Marketing AI solutions that was valued at 5.00 Billion USD-Dollars in 2017. The market size has been prognosed to reach 40.09 Billion USD-Dollars by 2025, at a Compound Annual Growth Rate (CAGR) of 29.79% during the forecasted period. (Marketsandmarkets.com, 2017)

1.2 Research gap

The research on the use of Artificial Intelligence in Marketing has started rather recently, most studies have been conducted within the last four years. The gap between AI research and AI application in advertisement and branding is still very noticeable. The theoretical findings still need to be supported by real tools and software solutions. In the academic field, most researchers either concentrate on describing one or two of the newest solutions on the market or mention very generalized application fields, concentrating on AI as a phenomenon and main study objective. There is little research available on the outcomes of generally implementing AI in marketing and on the results of implementing specific AI tools. Additionally, there is a very limited amount of conducted studies on the strengths and weaknesses of the Marketing AI based on real data or measurements. Quite visible is also the lack of analysis of the customers' attitude towards AI-powered advertising.

1.3 Research objectives

This thesis aims to answer the following research questions based on the literature review:

- What areas of Artificial Intelligence find application in International Marketing?
What are the existing AI-based solutions in the field of Marketing on the international market?
- How does the AI influence strategic decision-making of international companies?
How can Marketing AI be applied in marketing planning?
- What is the connection between the use of AI and Innovation Management?

Additionally, this paper will include an empirical study based on primary data that will investigate the international market for Marketing AI from a corporate perspective.

1.4 Hypotheses

In order to provide answers to the above-stated questions and provide guidance for the research following hypotheses have been developed:

H1: The development and introduction of Marketing AI in international companies require efficient innovation management

H2: Marketing AI can be applied for each element and at every step of strategic marketing planning of corporate market agents

H3: AI-based tools enhance the effectiveness of strategic marketing in international companies

1.5 Delimitations of the study

To provide an in-depth analysis few limitations to this study need to be set. As the research on Marketing AI is rather new, there is a limited amount of relevant studies available. At the moment, most academic research concentrates on presenting the existing solutions and their application in marketing. Unfortunately, a lot of studies neglect the international market opportunities for AI-powered marketing tools, concentrating solely on their use and not on the development and introduction of such solutions. This study will present a holistic product life-cycle of marketing AI with emphasis on the idea, development process, and finding the right market opportunities on the international level for such products. As this study is meant to investigate the global market of AI-based marketing solutions, only tools and technologies that have been recognized and implemented internationally will be taken into consideration.

1.6 Structure of the thesis

This paper consists of an introductory chapter, two major sections in the main body, and a conclusion part with an outlook. Chapters two and three are theory-based, they are presenting a throughout literature review which has been a foundation for the empirical study. The empirical study is included in chapters four and five of the following thesis.

The second chapter is aimed to define and explain concepts related to technology, Computer Science and Artificial Intelligence. It should provide the reader with an understanding of what operations and processes hide behind each term and how it can be implemented. It includes the review of the existing Marketing AI tools and technologies on the international market. Additionally, it is based on secondary data and elaborates on the influence of AI application on the components of Marketing Mix such as Product, Price, Promotion, and Place. On top of that, it investigates the advantages and disadvantages of AI use in Marketing for consumers and marketers. The third

chapter presents the theories connected to the use of Artificial Intelligence in the Marketing context.

The empirical study in chapters four and five are based on two interviews with representatives of companies that provide software/platform products for Marketing AI. It investigates the current and forecasted market opportunities for such technology. The thesis ends with a conclusion chapter.

2 Theoretical background

2.1 Areas of AI

The following subchapter is going to define the main concepts and terms connected to Computer Science and Artificial Intelligence for a better understanding of the technology behind it. It provides a brief definition with a short explanation for each subset as well as a quick insight into the implementation areas. Pedro Domingos, a professor of Computer Science at the University of Washington has said “AI is the goal; AI is the planet we’re headed to. Machine Learning is the rocket that’s going to get us there. And Big Data is the fuel”.

2.1.1 Artificial Intelligence (AI)

In 1950, Alan Turing wrote a paper called “Computing Machinery and Intelligence” which has been since then identified as a starting point for research on AI. However, the term Artificial Intelligence has been first introduced a little bit later, by John McCarthy in 1956 as "the science and engineering of making intelligent machines". For over 60 years the scientists have been working on making machines fit to imitate the cognitive functions of the human brain such as learning, knowledge representation, reasoning, or prediction/planning (Wirth, 2018). Nowadays the Artificial Intelligence is defined by Oxford Dictionary (2019) as “the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages”. The core of AI lies in the automation of data processing, data analysis, the capability of performing cognitive, human-alike tasks by machines, and their learning abilities based on the collected data (Jarek and Mazurek, 2019).

The AI can be divided into Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and Artificial Super Intelligence (ASI). Artificial Narrow Intelligence

describes the computer's ability to perform a certain task extremely well, i.e. playing chess. Artificial General Intelligence refers to a computer's ability to perform a task in a way a human being could. Artificial Super Intelligence is the machine's ability to surpass the human mind and intellect. (Hussain, 2018) The ASI is the newest invention in AI research. Until recently, the development of AI solutions was like a race where the finishing point and the ultimate goal was being able to fully copy the abilities of the human brain. A study conducted by Barrat (2013) among AI researchers has shown that 42% of them believed that this will be achieved by 2030 and 67% - by 2050. In 2015, American scientists have announced the creation of a system for data analysis that has beaten 615 out of 905 human teams. (Kanter and Veeramachaneni, 2015)

The practical applications of AI are indefinite. The solutions based on AI have been implemented i.e. in medicine for cancer or aneurysm diagnosis, in automotive for the development of self-driving cars, or finance for trading and investment. The following paper will however concentrate on and throughout analyze the AI application possibilities in Marketing and Consumer Research.

2.1.2 Big Data

Big Data has been first defined by Gartner around 2001 as "big data is data that contains greater variety arriving in increasing volumes and with ever-higher velocity". The term "Big Data" has been since then used to describe large and complex data sets which are so voluminous that traditional data processing software is unable to manage them. However, those large amounts of data are helping people solve problems they would not be able to even identify before. The data generated and collected by social media platforms, online services, and mobile devices with internet connection help developers address emerging problems and provides business professionals with meaningful information. Big Data is used for i.e. product development, customer experience measurement, product demand analysis.

2.1.3 Artificial Neural Networks

Artificial Neural Networks (ANNs) also known as Neural Networks (NNs) are the foundation of AI. They are computer systems which build have been inspired by the structure of the human brain (Chen et al., 2019). The human brain consists of billions of cells called neurons, which are responsible for information processing and are connected in a web-like net. Accordingly, the ANNs have thousands of interconnected artificial neurons called processing units. Similar to the human brain, ANNs also require a set of rules and guidelines for learning purposes. The ANNs' implementation process usually starts with the learning phase where they learn pattern recognition under human supervision. (Frankenfield, 2020)

The practical applications of ANNs include i.e. spam detection for e-mail providers or credit risk assessment for financial institutions. Artificial Neural Networks are also used to create chatbots or in e-commerce to provide customers with personalized recommendations. The number of sectors and industries where ANNs or solutions based on ANNs can be applied is extensive and ever-growing, from the medical field through banking to production sites.

2.1.4 Machine Learning (ML)

Machine Learning (ML) is a subset of AI that enables computers to “learn” and improve algorithms through experience automatically. Precisely, it focuses on developing computer programs that can collect data, establish links between various data pieces and draw conclusions from it. The process of learning includes observations of exemplary data, direct experiences, instructions, pattern recognition in data analysis. The ultimate goal is to allow computers to learn without human assistance. (expert.ai, 2020) Before ML, computers have been following a number of predefined rules (Jarek and Mazurek, 2019), nowadays they are able to set the rules by themselves.

Machine Learning is usually used for pattern recognition, statistical modeling, data analytics, predictive analytics, or adaptive systems. Therefore, ML has found application in i.e. dynamic pricing, product recommendations, personalized marketing, process automation, or fraud detection. Additionally, one of the most known applications of Machine Learning (together with Natural language processing explained in 2.4) are the voice assistants in mobile devices - Siri (by Apple) or Alexa (by Google).

2.1.5 Deep learning (DL)

Deep Learning (DL) is a subsection of Machine Learning where the computer is able to learn without any human supervision from data that is unstructured and unlabeled. DL takes advantage of Big Data and computing power to analyze data that could take human beings decades to comprehend and draw relevant conclusions. (Hargrave, 2019).

Deep Learning has found application in numerous industries. Its ability to detect objects and make autonomous decisions has been implemented in many modern solutions. Nowadays, DL is used for i.e. image recognition, face recognition in access control, medical diagnostics tools, development of self-driving cars.

2.1.6 Natural language processing (NLP)

Natural language processing (NLP) is an ML-based subset of computer science strongly linked to artificial intelligence and linguistics. Its aim is speech recognition, natural language understanding, and natural-language generation. The research of NLP has concentrated on the context, the vocabulary, the syntax, and the semantic meaning to help computers understand and interpret human language. (Alpaydin, 2016) Due to NLP, computers are not only able to read text or hear and understand speech but also detect emotions in the speech or determine which parts of the spoken text were important.

The voice assistants such as Siri or Alexa have been developed with the help of NLP. Additionally, the Natural language processing is commonly used for translation, transcribing calls, speech-to-text applications. This technology has also found application in assisting the visually handicapped.

2.1.7 Computer Vision (CV)

Computer Vision is a term describing a subset of Artificial Intelligence that investigates how computers can understand and interpret digital images and videos. The aim of Computer Vision was to automate image recognition to achieve the level of visual perception of human beings, however, today's systems are described by researchers as more accurate than human vision as their reaction and detection time is shorter. Due to the rapid development of Computer Vision systems, increasing computing power, and rising popularity of mobile devices with built-in cameras that have contributed to swamping the internet with pictures and videos, over the last decade, the accuracy rate for object identification systems has increased from 50 percent to 99 percent.

Computer Vision technology has found a huge application field in medicine as image processing systems dedicated to X-Ray, MRI or CT enhance the diagnostics abilities of medical professionals. Additionally, Computer Vision has been widely applied in the military branch for navigation and detection purposes. Another example of CV application is an automatic inspection in manufacturing sites, visual surveillance, or people counting and organizing huge databases of images.

2.2 Review of Marketing AI tools on the international market

The following chapter presents an analytical overview of the existing marketing solutions based on Artificial Intelligence. The available tools have been divided into few categories that represent the key technology behind them. The aim of this review is to elaborate

on the different technologies and it should be seen as an introduction into the next chapters that will concentrate on the results of presented solutions for Strategic Marketing.

2.2.1 Text processing technologies

Academic research mentions multiple examples for use of Natural Language Processing (NLP) in marketing. For instance, many companies use automatic chatbots on their websites or social media for facilitating communication with the customer. However, chatbots are nowadays not only offering automated responses and enabling 24/7 customer support, but they also collect information about the visitors for customer research purposes. The newest chatbots are created with the help of Machine Learning, which means that they have the ability to learn and improve with each conversation they have. (Sterne, 2017)

In 2018, Alibaba, an infamous Chinese e-commerce giant has developed an AI copywriter tool that generates efficient ad slogans and creates product descriptions. The technology has been since then sold to numerous foreign companies. (Yao for forbes.com, 2020) The NLP technology has allowed companies to understand the customer sentiment and emotions connected with purchase choices, it helps marketers collect data about online customer behavior, brand experience, customer response to ads. Such customer sentiment measurement services, also known as opinion mining, offer i.e. ForeSee. ForeSee uses NLP and Machine Learning as well as employs 200 data analysts and has 15 years of structured data for benchmark. (Sterne, 2017)

Text mining helps marketers to understand and analyze the word-of-mouth (WOM) posted online (Overgoor et al. 2019). Qazi et al. (2014) have investigated the identification and classification of online reviews with the focus on the suggestive type. The findings of their study provide an insight that effective analysis of suggestive reviews and customer feedback helps retailers and manufacturers to significantly enhance the customer satisfaction level and sales.

Kühl et al. (2019) have examined supporting customer-oriented marketing with AI-based on automatically quantifying customer needs from social media posts. They concluded that supervised Machine Learning can be used for social media posts analysis and automatic need quantification for companies.

2.2.2 Voice processing technologies

According to TechCrunch, in 2019 55% of American households owned voice-activated speakers. Products such as Amazon Alexa, Siri, Google Home, Cortana allow customers to research and purchase products just by speaking to a mobile device. (Jarek and Mazurek, 2019) This has also become a path for marketers to advertise things, as far as Voice Search Optimization goes. Advertising via Voice Assisted Platforms has become a new trend in marketing. People mostly use Voice Assistants for spontaneous, immediate searches and expect quick answers – that is why Voice Search Optimization (VSO) is much more complex than Search Engine Optimization (SEO). The customer mostly hears the first provided result and does not go through the whole page or a couple of pages as when searching for something in Google.

However, mobile devices are collecting data from voice and speech not only while using speech recognition options for search engines. In 2019, Google has admitted to eavesdropping on private conversations via Google assistant and that Google employees have been able to listen to conversations that should not have been recorded in the first place. The company has provided an explanation that the recordings were meant to increase the effectiveness of Google AI products. (Paul for theguardian.com, 2019)

Additionally, speech and voice recognition have been widely implemented in customer support for collecting basic information about the caller and the case. Based on that information the system is connecting customers to the right assistant without needing to employ multiple call centers or first-line support assistants.

2.2.3 Image recognition technology

As the image and photo processing technologies have progressed, additional opportunities for marketers have emerged quickly. Image recognition has found numerous applications in marketing. Existing on the market software allows very thorough analysis of the viewed images or watched videos by a website visitor – it classifies images and detects specific objects, assigning visitors to a specific market segment which contributes to the more targeted advertising and more accurate product recommendations.

With the rapidly growing popularity of social media, the amount of information available on the internet to specific users increased significantly. (Perrin, 2015) According to Capatina et al. (2020), AI-based image analysis can be used for brand logo recognition in social media. Based on the photos social media users post, connections can be drawn towards their interests, wants and needs even more precisely than based on textual data. More sophisticated marketing analytics algorithms can detect specific features that have been especially interest enhancing for a certain user, i.e. colors, patterns, styles to even further personalize ads.

Jarek and Mazurek (2019) in their study present how image recognition and processing technology can be used for creating extraordinary marketing campaigns. For instance, a trend among make-up and cosmetics brands such as Shiseido or Estee Lauder is, to provide customers with a software tool that analyses the condition of their skin or face features to provide personalized shopping recommendations. The e-commerce giant - eBay, has developed a solution that was meant to facilitate the choice of the best Christmas gift by recognizing the movements of the buyer's face while he was going through gift suggestions and assigning them with emotions. Chinese retailer Alibaba has in 2018 launched a concept store called "FashionAI" that included smart mirrors with touch screens that could analyze the customer's appearance and conclude what products could correspond with their taste and style. AliExpress allows its users to search for cheaper alternatives of products from other retailers by uploading a picture of said product.

2.2.4 Decision-making technologies

The decision-making and decision-support solutions have been widely implemented in modern e-commerce. Jarek and Mazurek (2019) provide numerous examples of their use in their research. They mention Services such as Amazon or Netflix that provide their visitors with product recommendations based on the search history. The cooperation between Spotify and Emirates results in a personalized travel destination match. Additionally, if a customer buys a plane ticket online, the Dutch travel agency Booking.com will be aware of the destination and the timing and will provide recommendations as soon as they enter the website. Additionally, many online retailers use AI-based dynamic pricing solutions which adjust prices based on the previous shopping records or even the device being used. For instance, if a customer uses an Apple device to visit the website, the price of the products displayed might be higher than when browsed from an Android device, as Apple devices are usually considered more expensive. Tools such as Salesforce synchronize customer data from all accessible sources, such as i.e. social media, e-mail, phone calls, and present them in one place to effectively manage and improve customer service.

Decision-making technologies have also found application in strategic marketing. There are numerous platforms for marketing campaign management. They usually collect data with the use of AI and then provide recommendations to the marketers for the most efficient campaign strategy and activities. (Jarek and Mazurek, 2019) According to Stone et al. (2019), suggest that implementation of AI in strategic decision-making has its roots in the competitive attribute of marketing and its main strength is eliminating the cognitive bias that might be problematic in individual or group decision-making. This study highlights the benefits of AI application in marketing decision-making such as increased speed, increased rationality due to the lack of cognitive bias, learning from experience, better identification of competitive threats, and increased quality management of marketing projects.

2.2.5 Autonomous devices and machinery

The most popular invention among the autonomous devices supporting marketing is the service-free shops i. e. Amazon Go. (Jarek and Mazurek, 2019) Similar solutions have been widely implemented in Poland since 2019 after the Polish government has introduced the Sunday trading ban as a way to get around the law. In Shanghai, an AI-powered self-service convenience store Moby Mart is even able to autonomously travel to the warehouse for replenishment. Additionally, worth mentioning are solutions that have the aim of improving the physical shopping experience such as already mentioned in 3.3 FashionAI by Alibaba. Another example is the Eobuwie store in Poznań (Poland) which has autonomous machines that measure the feet in all dimensions and then based on the measurements the customer can choose shoes they like on one of the tablets installed there. The software not only matches the customer with shoes of the right size but also provides recommendations about what kind of shoes will be comfortable for the customer's foot type. There are no shoes on display as there are no shelves in this store. The selected shoes will be brought to the customer after sending a request for fitting.

2.2.6 Personalized Engagement Marketing

Kumar et al. (2019) has examined the role of AI in Personalized Engagement Marketing and provides an integrative framework for a better understanding of this concept. Personalization is often confused with customization, however, both terms differ in application. Personalization is the decision to adjust the Marketing Mix to the customer based on the previously collected customer data, whereas customization occurs when the customer chooses one or more elements of the marketing mix by themselves. The most recognized example of personalization is the "recommendations" section i.e. on Netflix or Amazon.

Personalization aims to strengthen the positive, emotional relationship between the brand and the customer as it is the base for customer engagement behavior. The development of personalization in Marketing has evolved from rules-based systems into deep-learning, data-driven ones. The customers are mostly unaware that the retailers collect data on them in order to personalize their advertisements. The success of such solutions might be however limited due to the volume and quality of collected information. Thus, the research on AI solutions for Marketing revolves around creating a system that would not only increase the companies' ability to collect and analyze data but also that would autonomously and effectively implement the created insights. (Kumar, 2019)

3 Theoretical framework

This chapter aims to present the existing theories connected to the management, use, and implementation of Artificial Intelligence for marketing purposes of international companies.

3.1 Innovation Management in International Marketing

The first mention of “Innovation” has its roots in Schumpeter’s (1934) paper in which he associated it with economic development and a new combination of productive resources. The definition of innovation has evolved since then; nowadays it is considered “a problem-solving process” (Dosi, 1982), a learning process (Dogson, 1991), a process involving the exchange of codified knowledge (Patel and Pavitt, 1994). Hidalgo and Albers (2008) state that knowledge is the economic driver in the current economy. Godin (2003) calls information and communication the core of the new economy. With no doubt, Artificial Intelligence belongs to the most knowledge-driven and highly innovative industries. The development and introduction of AI products require an enormous amount of managerial and strategic planning. In order to foster innovation within international companies, a number of innovation management techniques (IMTs) have been developed and introduced. Those techniques should be implemented in the Research and Development (R&D) of AI-based marketing products, as the New Product Development in International Marketing requires not only technical advancement and knowledge but also social awareness and prowess. (Tzokas et al., 1997)

3.1.1 Innovation Management Techniques in knowledge-driven industries

Innovation management is often associated with knowledge management (Coombs and Hull, 1998). A model proposed by Dogson (2000) is based on six areas of innovation management: R&D, new product development, commercialization of the innovation,

operations, and production, technological collaboration, and technology strategy. Dogson (2000) elaborates on how Innovation Management is a complex and risky matter which requires knowledge management and organizational skills. He states that innovation is not always about using the latest, most advanced technology, often it is about finding creative solutions to existing problems. The model presents Innovation Management Techniques (IMTs) as a collection of tools, techniques, and methodologies for companies to use in order to be competitive in a knowledge-driven market. It can be applied to large as well as small international companies.

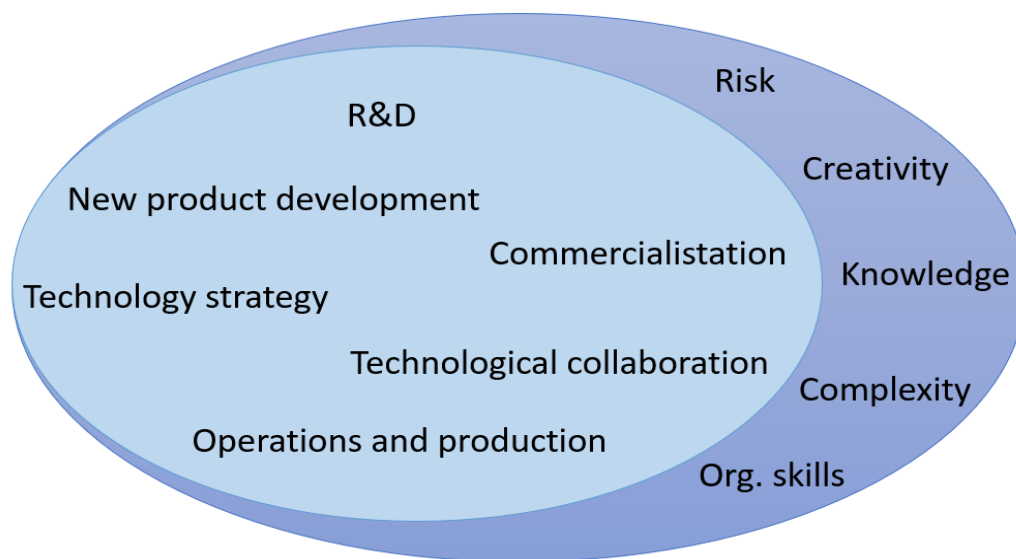


Figure 1. Management of technological innovation: a holistic approach by Dogson (2000)

Hidlago and Albros (2000) have been investigating the IMTs and their relevance for international companies. They state that the current economy is based on knowledge-driven industries which are characterized by a high degree of connectivity between market agents. This study concentrates on IMTs being the key to increasing competitiveness in the international market. The IMTs presented in this study have been selected by applying parameters such as: development and standardization of IMT, systematic

methods of application; focus on knowledge, and free accessibility. For said study following 10 IMT typologies have been selected:

1. Knowledge management tools
2. Market intelligence techniques
3. Cooperative and networking tools
4. Human resources management techniques
5. Interface management approaches
6. Creativity development techniques
7. Process improvement techniques
8. Innovation project management techniques
9. Design and product development management tools
10. Business creation tools

The study proves that no IMT can be considered individually, usually, a combination of multiple IMTs leads to benefits such as competitive advantage or finding innovative solutions to current business challenges. The understanding of IMTs and their associated application methodologies support corporate innovation and knowledge management. The results of this study present project management, business plan development, corporate intranets, and benchmarking as the most used activities in international innovation management. Another finding of the study is that a correct application of IMTs enhances the corporate ability to successfully introduce new highly innovative products to the customers.

3.1.2 The use of R&D for enhancement of marketing activities

Tzokas et al. (1997) present in their study a statement that R&D activities may enhance marketing efficiency. They elaborate on how the marketing considerations should follow the innovation process from the beginning and influence all the R&D works, not only the New Product Development phase. The R&D is presented as a mechanism to generate

marketing resources. Additionally, due to the earlier mentioned cooperation and connectivity requirement in innovation management, it is a testing stage for the corporate abilities to facilitate and manage the relationship with other market players. The R&D can be a means of linking the companies to “early adopters” of new products or services. Tzokas et al. (1997) see in R&D an opportunity for the supplier and the customer to co-operate as the early cooperation should enhance the effectiveness of the introduction of highly innovative products to the international market. The collaboration already in the R&D stage will make the potential corporate customers aware of the existence of the product, will trigger the need for cooperation, and can even influence decisions regarding the technology transfer partnerships and knowledge exchange.

3.2 AI in the strategic decision-making - Marketing Mix (4 Ps)

The Marketing Mix known also as 4 Ps is a marketing decision-making framework first introduced by E. Jerome McCarthy. It is defined as a set of “marketing tools that the firm uses to pursue its marketing objectives in the target market” (Kotler, 1999). The 4 Ps stand for: product, price, promotion, and place. They represent the key factors that influence the outcomes of marketing strategy. This chapter will investigate the influence of implementing AI-based tools, such as the examples presented in chapter 3, on the elements of Marketing Mix.

3.2.1 Product

The AI solutions enable marketers to collect a spectrum of data that can be used for new product development or product improvements. The algorithms can analyze what attributes the customer segment seeks and use the insights to create products with the combination of the most desired attributes. (Jarek and Mazurek, 2019) Personalization or even hyper-personalization leaves consumers with the feeling of being “cared for” and delivers the experience of personal customer service even in e-commerce. Additionally,

the customers do not need to look extensively for a product they might be quite possibly looking for, which often results in a purchase decision. However, retailers can manipulate the sales of a certain product or a brand by displaying them over competitive products and brands. Similarly, automatic recommendations enhance the probability of choosing a recommended product over a non-recommended one. For instance, one-third of Amazon's revenue comes from recommended purchases and three out of four movies on Netflix are watched thanks to its recommendation systems. (Conick, 2017) Moreover, due to AI and AI-powered data analysis brands are able to create additional value to the products or introduce additional solutions beyond the product category. (Jarek and Mazurek, 2019)

3.2.2 Price

The price management and pricing can also be supported with the use of AI. The dynamic pricing strategy has been already shortly introduced in subchapter 2.1.4. Dynamic pricing is a way of companies manipulating the prices of products available online based on the data collected from the visitor. The system can analyze browser history, previous searches, the times the product has been seen by the same user, or what device is being used to make the search provide "personalized" pricing. (Shakya, 2010)

3.2.3 Promotion

Artificial Intelligence contributes extensively to the promotion-related actions of the Marketing Mix. First and foremost, the use of AI-based solutions often allows marketers to create a one-of-a-kind shopping experience. Especially physical solutions such as self-service convenience stores, smart mirrors, or smart shoe fitting gain recognition because they evoke excitement among customers that are first introduced to those. Additionally, the personalized communication, often implemented with extensive use of modern social media such as Instagram or Facebook works in favor of the customers' relationship

to the brand. Offering personalized benefits, gifts, discounts helps companies promote their products or services more effectively and can contribute to the increased spread of positive Word-of-Mouth by sharing knowledge with others about the worthwhile experience. The personalized recommendation systems enhance the promotion abilities of specific brands and eliminate the process of the customer going through the whole product category by promoting specific products of said category. On top of that, the personalization and customization potential of AI minimizes the disappointment and more often makes a positive impact on the customer. (Jarek and Mazurek, 2019)

3.2.4 Place

The sales and distribution understood as the “Place” in Marketing Mix can be improved by using AI solutions. There are numerous AI-based systems implemented in logistics departments for faster and non-disturbed deliveries. Additionally, the self-service shops enable convenient shopping and allow sales even against the state regulations (the Polish example) or 24/7. Customer service can be improved by using chatbots or special tools for consultant-less customer support (i.e. comparison tools implemented on the retailers' website). Automation of marketing processes can provide companies with new distribution channels and allows autonomous merchandising. (Jarek and Mazurek, 2019)

3.3 The theoretical framework for CRM supported with AI

Customer relationship management (CRM) is deeply rooted in the strategic management activities of international companies. A recent study by Libai et al. (2020) has investigated supporting CRM with Artificial Intelligence tools and has developed a theoretical framework for connecting CRM with AI. The study concentrates on the AI abilities and their application for CRM activities such as: customer acquisition, customer retention,

and customer development. Additionally, it also conducts an analysis of the outcomes of the application of AI abilities in regard to the firm, the customer, and the society.

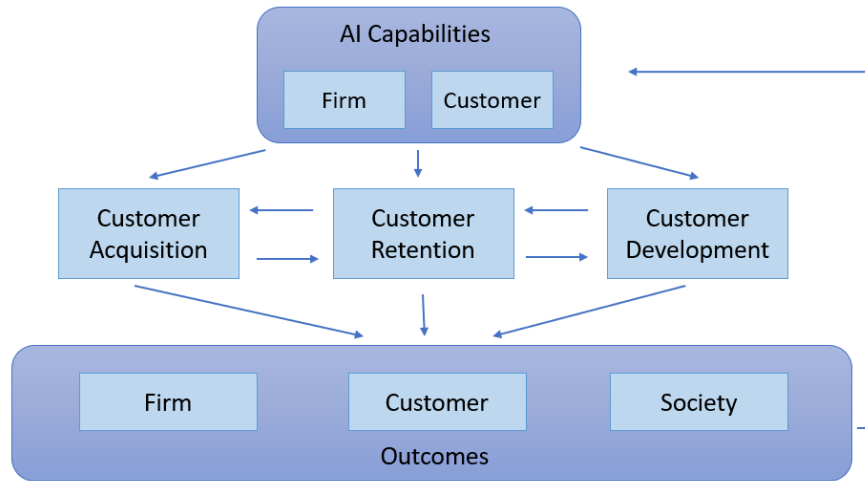


Figure 2. Customer relationship management supported with AI model by Libai et al. (2020)

The AI capabilities explored in this study are divided into two groups: “leveraging big customer data” and “communicating, understanding, and creating the way humans do”. The first group describes the use of large datasets to incorporate Machine Learning and Deep Learning for CRM purposes and connects acquiring and maintaining Big Data for the competitive advantage. The second one explores the creation of tools that help computers communicate with customers in a way, they will believe they are communicating with another human being. Both capabilities of AI improve with time and experience.

The Customer Relationship stage is what follows after the application of one or both AI capabilities into the customer relationship management strategy of the company. This stage has been divided into three phases: acquisition, retention, and development. In the Customer Acquisition phase, the AI supports the attraction of new customers by minimizing the customer acquisition costs and increasing the lifetime value of newcomers. Worth mentioning is during this phase the use of predictive AI to forecast upcoming trends and movements. Additionally, the companies are able to collect information

about the customers of the competitors in order to develop strategies to acquire the most valuable of them. The Customer Retention phase describes the activities of the company undertaken to increase the duration of the relationship between the company and the customer. For the purpose of customer retention AI capabilities such as personalization or habit formation can be used. The Customer Development phase refers to increasing the value of the current customers by increasing the margin or the frequency of consumer behavior.

The framework examines also the outcomes of the application of AI into customer relationship management. They have been divided into three groups: customer-related, firm-oriented, and society-related outcomes. To the most common customer-related outcomes count the enhanced personal customer service and the prioritization of the minority of the most valuable clients. The firm-oriented outcomes are dependent on the resources of the company, therefore firms with a large number of resources gain the competitive advantage that can lead to the creation of monopolies and oligopolies. The social-related outcomes are strongly connected to the two previous ones and include i.e. neglection of lower-earning customers or increased prices as a result of monopolies and oligopolies.

3.3.1 Social-media use for CRM purposes

Trainor et al. (2013) have carried out a study on the use of social media for customer relationship management purposes. As a result of the study, social media has been presented as an opportunity for international companies to combine technology and customer-centric management systems in order to enhance the performance of marketing activities. It suggests that companies by investing in social media gain relationship management benefits. However, to gain a competitive advantage, companies should not only use social media but use the information it delivers and make it a tool to develop capabilities and strategies to better understand their consumers. Social media use should be supported with technological investments and aligned with the internal management

systems. The by Trainor et al. (2013) suggested framework for social media use in CRM has been presented on the model below.

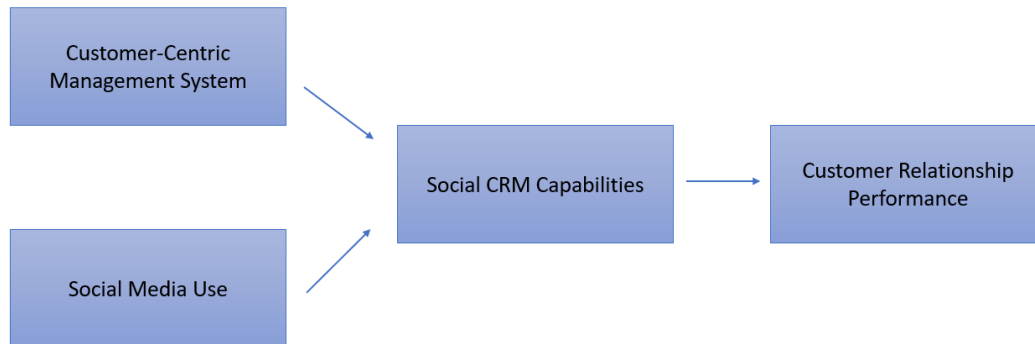


Figure 3. Framework for social media use in CRM based on Trainor et al. (2013)

3.4 Strategic marketing planning with AI

Huang and Rust (2021) have developed a three-stage strategic framework for the implementation of AI into the marketing planning of international companies. The framework is based on the research-strategy-action cycle and it presents strategic planning as a circular process that starts with research, goes through the phase of planning strategies, and ends with undertaking actions to execute the planned strategies (see figure 3). The circulation of the processes is based on the assumption that the actions result in data that can be further used for marketing research. The authors of this strategic framework present a concept that there are multiple AI intelligences: mechanical, thinking, and feeling.



Figure 4. Three-stage strategic framework for implementation of AI by Huang and Rust (2021)

The authors present a statement that all three of them deliver unique benefits: mechanical AI – standardization, thinking AI – personalization, feeling AI – rationalization. In this specific framework, mechanical AI is responsible for the automation of repetitive and routine tasks. Thinking AI allows data processing to draw new conclusions or meet decisions; it is good for recognizing patterns in data (can be used i.e. for speech or image recognition) and is the base for Machine Learning, Deep Learning, Neural Networks. Feeling AI is the name for actions that involve humans, i.e. natural language processing or chatbots simulating interaction with other human beings.

The base for the framework development is using the AI for marketing that connects all three AI intelligences and their assigned benefits. At the marketing research stage, AI is used for market intelligence. This includes data collection, market analysis, and customer understanding. In the marketing strategy stage, the AI is used for meeting strategic decisions about market segmentation, targeting, and positioning on the market. In the marketing action stage, the AI is used for standardization (i.e. autonomous delivery tracking), personalization (i.e. recommendations), and rationalization (i.e. autonomous customer service, chatbots) purposes.

In the Marketing Research phase, the authors suggest using mechanical AI for data collection as it allows automation of the easily accessible data. The mechanical AI can collect data on customer behavior, product usage, and consumption, it can create heat maps and capture marketing activity data. It has been proved that mechanical AI can collect data efficiently and at scale. It can be used not only to collect observable data but can find implementation in surveys and experiments, as those can be automated and do not require human supervision any longer. The thinking AI should find its application in the market analysis, i.e. to identify competitors, competitive advantages, new markets. It can be used for predictive analysis, consumer research based on text or picture analysis, social media analysis. The feeling AI is reserved for the customer understanding purposes – its distinction from the market analysis is based on the fact, that customer understanding considers sentimental and emotional data about customers' feelings, preferences, attitudes. This allows measuring the level of customer satisfaction and happiness levels.

In the Marketing Strategy phase the three key strategic decisions need to be made: segmentation, targeting, and positioning (STP). Segmentation uses the mechanical AI with its mining and grouping techniques to “slice” the market and by doing so – identify undiscovered patterns. It allows discovering patterns that human marketing analysts are unable to see. Targeting is choosing the right segment – for this purpose, the authors of the strategic framework suggest the application of thinking AI as it can combine statistical and data-mining techniques for identifying the best targets. Positioning allows brands to connect the product attributes with the customer needs and therefore find the right position in the customers' minds. For the aim of positioning, the feeling AI is recommended – for the strategic decision about positioning, the attributes such as emotion, feeling, satisfaction analytics are the most useful.

In the Marketing Action phase, the authors present using the three AI intelligences individually or collectively for the purpose of enhancing the areas of Marketing Mix (4 Ps) – Product, Price, Place, and Promotion. For each area, standardization (mechanical AI),

personalization (thinking AI), and rationalization (feeling AI) actions can be planned and carried out.

4 Research Methodology

This chapter will present the chosen research philosophy and approach followed by their justification for this specific study. Additionally, the methodology of the study will be presented and the data collection methodology and research sample choice will be elaborated on. In the end, there will be an assessment of the reliability and validity of the study.

4.1 Research philosophy

Research philosophy is a system of beliefs and assumptions about the development of knowledge (Saunders et al., 2019). Conducting research requires the researcher to make a number of assumptions (Burrell and Morgan, 2017). The assumptions influence the understanding of the research question, the choice of methodology, and the interpretation of the findings (Crotty, 1998). There is no “right” research philosophy to apply for business and management studies (Saunders et al., 2019).

This study will follow the interpretivism philosophy. Interpretivism's objective is that human beings and their social aspect cannot be studied in the same way as physical objects in natural sciences. Interpretivism concentrates on complexity, richness, multiple interpretations, and meaning-making and is therefore subjectivist. Its focus is on the interpretation of data. The aim of the researcher is to understand the research participants with great empathy. (Saunders et al., 2019). In the interpretative philosophy, the research is interpreting the data. The analysis does not need to be generalizable, however, the interpretation needs to be believable and well augmented. The data is the representation of the language and culture, can be small but needs to be analyzed carefully and thoroughly. (Eriksson and Kovalainen, 2016)

The choice of interpretivism has been based on the characteristics of the following study. As the study has been conducted through two semi-structured interviews with two

people in different professional positions, from two different backgrounds and with quite different roles in the process of implementing AI solutions on the international market, the contrast between both of them is an important aspect to be considered in the interpretation of the data. Additionally, the research sample is quite small, so the generalization of the results would not be reliable. The interpretivism philosophy allows the researcher to emphasize the differences between the research participants, as they are inseparable from reality, in order to draw conclusions from them. The knowledge in the interpretative research philosophy is based on the description formed by human beings with different life experiences – therefore it is very much suitable for this kind of empirical study based on semi-structured interviews.

4.2 Research approach

This research paper follows the deductive approach as the theory based on the academic literature review is being tested in the empirical study. In the deductive approach, the data collection is used to evaluate the hypotheses related to the existing theoretical framework. (Saunders et al., 2019) The deduction is by far the most effective way to build up theoretical knowledge (Eriksson and Kovalainen, 2016) and although it is mostly used in quantitative studies, it can be used in the qualitative study as well. (Creswell, 2013)

4.3 Qualitative study as a research method

Qualitative research is concerned with interpretation and understanding in comparison to quantitative research that deals with explanation and statistical analysis. The qualitative research approach allows the collection of data to be sensitive to the social and cultural context of the research participants and aims at a holistic understanding of the studied objectives. (Eriksson and Kovalainen, 2016) Qualitative research is often not defined but presented as a contrast to quantitative research (Eriksson and Kovalainen, 2016). Silverman (2011) discussed the differences between qualitative and quantitative

research, presenting great appreciation for both of them and highlighting the fact, that both include a lot of internal variety, which makes any comparison between them inadequate.

The choice of qualitative study as a research method over quantitative one is based on the appropriateness of qualitative research in relation to the research question and the research objectives presented in chapter 1.

4.4 Data collection process

The following research is based on primary data. For the purpose of this research paper, two semi-structured interviews have been conducted using videoconferencing tools (zoom.us and Google Meet). The interviews have been recorded and then transcribed. The interviewees were two representatives of two different companies (Visua and Heuritech) which will be presented later on in the subchapter on the research sample. The interviews have been extended with a case study, as the interviewed companies have been also reviewed by the data accessible on the internet.

The process of preparation for the interviews has started with identifying companies that are providing SaaS (Software-as-a-Service) or PaaS (Platform-as-a-Service) products in the area of Marketing AI available on the international market and with customers spread all over the world. The next step has been focused on finding the connection to the companies and sending the interview request to the decision-makers of said companies.

The use of the semi-structured interview form for the empirical study has been motivated strongly by the fact that this form allows asking both “what” and “how” questions. The semi-structured interview allows to achieve a conversational atmosphere and helps to build a better connection between the interviewer and the interviewee. Semi-structured interviews are considered better to investigate the experiences and narratives

than standardized ones. (Gallatta, 2013) Therefore, the outline of the questions has been prepared before the interviews, however, it has been more of guidance than a list of questions to be asked. The intention was to achieve the feeling of an informal tone of the interview, as it has been proved, it makes the interviewees dig deeper into details and they provide more sincere answers than when confronted with a strict and formal atmosphere. (Gallatta, 2013)

4.5 Research sample

The research sample of this study has been two companies who have willingly participated in the interview for research purposes. The representatives of said companies have been informed about the objective of this research paper and have been offered to be anonymous. Both companies have decided not to be anonymous, therefore they will be briefly introduced in the following subchapters.

4.5.1 Visua

Visua is a Computer Vision-powered product that can be used for: logo/mark detection, visual search, and object/scene detection. It is being used by brands worldwide for brand protection, authentication, and monitoring purposes. Visua uses image processing technology to detect counterfeit and digital piracy as well as to monitor sponsorships, brands, and ads. By using this platform, companies can identify how their product is being presented on publicly accessible social media and internet platforms. They can create insights about the number of times a logo of the company has been displayed on the screens of the users and what kind of promotion activities to undertake in order to enhance the reach of marketing campaigns.

4.5.2 Heuritech

Heuritech is an Artificial Intelligence-powered platform used by the leading fashion brands worldwide to create forecasts and predictions about the upcoming trends and the customer choices of the next season. It analyzes social media images to capture the early signals and insights from fashion influencers and customers to enhance the effectiveness of the next fashion campaigns. The platform analyzes 3 million images each day to recognize general trends, colors, patterns, materials, textures, shapes, and specific products. Heuritech analytics are based on statistical aggregated data. Additionally, it offers monitoring tools to measure the positioning of the products offered by internationally recognizable fashion brands.

4.6 Reliability and validity

Patton (2001) names reliability and validity as two important factors in any qualitative research and states that both should be considered already in the study planning phase, not to mention while analyzing results or evaluating the quality of the study. Lincoln and Guba (1985) translate the terms of reliability and validity known mostly from quantitative research into Credibility, Neutrality, Consistency, and Applicability for qualitative research purposes. In the same study, they state that “there is no validity without reliability, a demonstration of the former is sufficient to establish the latter”. Patton (2001) agrees that reliability is a consequence of validity. Golafshani (2003) suggests conceptualizing reliability and validity as trustworthiness, rigor, and quality in the context of the qualitative study.

As the interviewees in this study have been people at the decision-making level in the presented case companies, there is no implication to undermine their credibility. The semi-structured interview outline has been prepared in a neutral manner. The answers provided by the research participants have been consistent with the current research and theoretical framework – the direct connection between the interviews and the

presented theories will be presented in the next chapter. The findings of the study can find applicability for comparable products.

5 Findings and analysis

The following chapter is aimed to compare the empirical findings with the theoretical ones from chapter 3 and test the hypotheses formulated as follows:

H1: The development and introduction of Marketing AI in international companies require efficient innovation management

H2: Marketing AI can be applied for each element and at every step of strategic marketing planning of corporate market agents

H3: AI-based tools enhance the effectiveness of strategic marketing in international companies

5.1 Development of Marketing AI and its introduction to the international corporate players

As thoroughly elaborated on in the theoretical part, companies who want to develop an AI-powered marketing solution need to carefully manage the innovation and knowledge, as it is a base for a good introduction to the international corporate customers. (Hidalgo and Albors, 2008) Worth noticing is that both Visua and Heuritech are companies that have been founded by scientists passionate about innovation and technology, not marketing specialists. Their observations and aspirations have been the basis to develop the highly innovative products they offer today.

The CEO of Visua provides a close insight on how the product has been developed from “noticing that more images and videos are being generated globally” to “building the technology and monetizing this trend”. The idea of Visua’s founders was to find a solution to one specific problem no one has found the solution to before. It is consistent with the definition of innovation by Dosi (1982) who stated that “innovation is a problem-solving process”. Therefore it can be said that the main goal of Visua was to innovate. Right after founding Visua, the company has applied a number of activities that can be

assigned to the model provided by Dogson (2000) on innovation management. At first, during the New Product Development phase Visua concentrated on “figuring out who really needs it” as their product was “rather nice to have than essential to have”. Boschini states that “it was a hurdle finding those who were ready and willing to invest in it straightaway. Therefore, the company first opted for going into the R&D phase during which they “build some small projects directly with brands”. At first, Visua chose to commercialize the technology directly to brands. With the advancement at the production stage, the company changed its market objective and followed the technology strategy concentrating more on technological collaboration. The choice to first sell Visua to brands helped the company to “build the core” and get the “industry tastes”. This has been the learning process leading to finally make the Visua product “extremely scalable”. Heuritech also required a carefully planned R&D as their product is based on machine learning that “becomes more intelligent with time”. In Heuritech’s case, the commercialization stage has been postponed until the New Product Development and Technology Strategy has been executed.

Furthermore, Luca Boschini concentrates and highlights in the interview the importance of the R&D process. This is consistent with the insights provided by Tzokas (1997) that the marketing considerations should navigate the R&D process and it should be treated as a testing platform for the corporate abilities of the company introducing the innovative product on the market. Heuritech is also built on extensive R&D. Visua as well as Heuritech are strongly relying on R&D as their products are still being improved and the spectrum of services they offer is being broadened. This lies in the sole nature of AI products, as they rely on the number of analyzed data which increases with time.

Visua and Heuritech both follow the innovation management guidelines and their activities are consistent with the theoretical insights on the importance of innovation management in companies with highly innovative products. Hence, the H1 is supported.

5.2 Application of Marketing AI by international companies

Visua and Heuritech are products that have found applications for marketing purposes of international companies. The theoretical part has provided insights on the use of Marketing AI for strategic decision-making and customer relationship management. This subchapter will connect the theoretical argumentation with real-life examples of how Visua and Heuritech contribute to the strategic marketing of their corporate customers.

At first, Visua was supporting brands in their marketing campaigns by analyzing the contents posted on the free-accessible social media accounts. This analysis aimed to find out how often is the brand mentioned and what is the emotional approach of the users towards the said brand. The product has evolved as “now every conversation starts with images and videos”, therefore the AI has since been expanded with image recognition and visual processing. The product is being used to support the strategic decision-making in all 4 subjects of the Marketing Mix by Kotler (1999). It helps companies to improve the product, adjust the price, manage the marketing activities and find the right distribution channels. On top of that, Visua has introduced an extension for counterfeit detection and copyright infringement in order to not only support brands and their products but also secure them. Heuritech cooperates with international companies including large retailers and luxury fashion brands such as i.e. AliExpress, Dior, Louis Vuitton, or Moncler. Their main objective is to support brands in the new product development phase by providing them with forecasts of what will be trending the next season. It allows the brand to increase sales (Product), develop a better pricing strategy by offering “trendy” products (Price), be the first one to set the trends on the market (Promotion), and reduce “overstock and ultimate waste from season to season”. As stated by Mollard in the interview “brands’ marketing teams use the quantitative trend insights to determine major marketing decisions involved in collection planning”. Additionally, Heuritech provides their clients with a spectrum of tools for “customer segmentation, geography, optimal launch date”.

If it was to confront both products with the model presented by Libai et al. (2020) it can be deduced that both products use AI capabilities to support firms in customer relationship management. Visua helps to increase the lifetime value of the customers and due to its analysis adds to customer retention. Heuritech contributes to all three phases of internal customer relationship management: acquisition, retention, and development. The company adds value to customer acquisition by providing brands with forecasts who enable them to attract consumers earlier than others, to retention by making the fashion brand stay always on top of the newest trends; and to develop by offering personalization tools. Worth noticing is also the way Visua and Heuritech use social media – as a source of information making social media much more powerful than just a communication channel for brands to advertise. Social media in this context is exactly as suggested by Trainor et al. (2013) – a technologically advanced add-on to the customer-centric management systems with the aim to enhance customer relationship management performance.

The presented insights from the interviews, as well as the provided examples, prove that Marketing AI tools can be applied at each and every step of the strategic marketing planning process within internationally recognizable companies. Hence, H2 is supported.

5.3 The influence of AI-based marketing tools on the effectiveness of strategic marketing

In chapter 3.4 a strategic framework based on the study of Huang and Rust (2021) for the implementation of Marketing AI into marketing planning has been developed. The framework aims at the enhancement of the effectiveness of applied solutions and presents three stages of international marketing activities: research, strategy, and action and their deeper division into mechanical, thinking, and feeling AI.

Both Visua and Heuritech offer Artificial Intelligence-based tools that concentrate on marketing research. Their work is based on extensive data collection (mechanical AI) that

they generate with the publicly accessible social media posts. The data they collect is then further analyzed (thinking AI) in order to provide insights that will support brands in the customer understanding (feeling AI). Both products have great accuracy, although it is still being improved – such improvements lie in the sole nature of AI and machine learning products as the algorithms have learning capabilities. Visua “focuses on extremely high performance, both in terms of scale, as well as precision” and achieves above 99% accuracy in regard to scalability and precision. Heuritech, as stated by Mollard in the interview “predicts trends with 90% accuracy up to 1 year in advance” by combining the works of data analysts and fashion teams in order to “back each trend forecast with qualitative and quantitative insights”.

Visua and Heuritech both present great results when it comes to the accuracy of their analysis. Their international corporate clients achieve higher margins and return of investment by applying those tools into their strategic decision-making. Hence, H3 is supported.

6 Conclusion and outlook

In conclusion, the international market is overflowing with advertisements and the marketing specialists within global companies struggle to find a solution to approach customers in a way no one has done before. The rapid development of modern technology, especially Artificial Intelligence has resulted in creating powerful solutions to bring international marketing to a whole new level. With the increasing use of social media and the internet, the amount of accessible data on customer behavior and customer relationships is enormous. Although the research on the use of Artificial Intelligence and related technologies is still rather limited due to how new the topic is, innovation has been an academic subject of research for more than 70 years. This paper has connected the existing research on innovation, customer relationship management, and social media use with the capabilities of Artificial Intelligence, Machine Learning, and Big Data in order to present the opportunities to enhance the effectiveness of strategic marketing within international companies.

In this thesis technologies and terms such as Artificial Intelligence, Big Data, Artificial Neural Networks, Machine Learning, Deep Learning, Natural language processing, and Computer Vision have been presented as well as their application possibilities with the emphasis of applying them for marketing. Furthermore, the existing Marketing tools used for worldwide-known companies have been presented and elaborated on. This descriptive part has been the basis for the theoretical framework part, as the latter is concentrating mostly on concepts and the outcomes of using Marketing AI. Additionally, it provides the reader with real-life examples of the strategies and concepts that have been analyzed in chapter 3.

However, the aim of the thesis was to not only present the existing technologies and their application possibilities with an analytical overview and examples but also to present theories and frameworks that have been behind the solutions. The theoretical review of existing theories adds value to the descriptive analysis of what is available in the Marketing AI market. Firstly, the theory on innovation management is being presented,

as it is the key to develop such a highly innovative product that is Marketing AI. It is being set up in the international marketing environment and presents a number of innovation management techniques to use in knowledge-driven industries. Additionally, there is an emphasis on the research and development phase as it is the pivotal one to introduce unknown solutions to the international market. Moreover, an analysis of available literature on the influence of applying Marketing AI into the strategic-decision making processes in international companies has been provided. It is based on the concept of Marketing Mix – Product, Price, Promotion, and Place, to highlight the advantages a company can achieve by supporting their decisions with AI in the marketing department. On top of that, the theoretical framework for customer relationship management supported with AI has been presented and further elaborated on. Worth mentioning at this point is also the use of social media as a source of insights to enhance the capabilities of internal customer relationship management systems. At the end of the literature review, a model for strategic marketing planning with Artificial Intelligence solutions implemented at each step has been provided and examined.

The empirical part of this thesis has been based on impretivism philosophy with a deductive approach. A qualitative study in form of two interviews fulfilled with a case study report on both participating companies has been conducted in order to confront the theoretical findings with real-life experiences and examples. The empirical study also aimed to test the hypotheses that have been formulated at the beginning of the thesis. The research sample has consisted of two companies offering unique Marketing solutions – Visua with its logo recognition and brand detection product and Heuritech with its fashion trend forecasting solution.

The findings of this study contribute to the existing research by combining the insights for the development and application stages of marketing AI for international companies. All three formulated hypotheses are supported in the empirical test environment. The study has proved that the development and introduction of Marketing AI in international companies require efficient innovation management. Additionally, Marketing AI can be

applied for each element and at every step of the strategic marketing planning of corporate market agents. Finally, it has been confirmed that AI-based tools enhance the effectiveness of strategic marketing in international companies.

Marketing AI is already strongly influencing international marketing and will most probably continue to revolutionize the advertisement we know today. Modern marketing nowadays is strongly supported by Artificial Intelligence and Machine Learning. The outlook for such solutions is bright and safe, as AI solutions are known to improve with time due to their learning capabilities. Scientists are also working hard to introduce even more advanced technologies and analytics tools to marketers worldwide. When it comes to the academic research on Marketing AI – it can be said that it has just started. Worth noticing is that the existing research that calls out AI as the tool to use for international marketing purposes has been conducted within the last few years. The perspectives are that there is much more to come. As this area of academic research is quite new, there is still a lot to be studied. An interesting study subject would be the customer approach towards AI-powered advertisement, privacy concerns connected to the use of data from social media for marketing purposes, or the extending abilities of AI to understand and analyze the customer behavior and emotions. Additionally, there is still a very much noticeable lack of research on the relationship between ethics and the use of Marketing AI.

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Appendices

Appendix 1. Transcript of the interview with the CEO of Visua – Luca Boschini

Dagmara Grzelska: Okay, thank you very much for joining me for this project. I will briefly tell you about it. I'm Double Degree student, I study at the European University Viadrina in Germany and the University of Vaasa in Finland. And at the moment, I'm researching my master thesis. My objective is the usage of artificial intelligence and marketing. I am reviewing the tools available on the international market for enhancing marketing strategies with artificial intelligence, machine learning, and big data. Your answers will be solely used for this project for me for my master thesis, if you wish to be anonymous, I can assure your anonymity as well.

Luca Boschini: Whatever works best for you. Like, I believe in transparency and all that works best for you. Use it the way that is best for you.

Dagmara Grzelska: Okay, I like that approach. I think it is very important to draw the background of your company and to introduce it. And also, the artificial intelligence solutions are so unique, it's pretty easy to identify the company by the product. My master thesis is about investigating the historical development as well as providing an analysis for the outlook of artificial intelligence-based tools offered in the marketing and branding proposals. And in this project, I am also suggesting a theoretical framework for implementing such solutions into the strategic marketing of international companies. I have few questions prepared. Some of them are very product-specific, specific for your product. Some are broader, and it is just me asking for your opinion or your observations. Okay. Let us start by telling me a little bit, what was the initial thought behind the Visua platform?

Luca Boschini: Yeah. So my co-founder is a former Google researcher in image recognition. And I was always attracted by technology, I had a passion for technology, I was always

very curious. And I always like to put things together, products together. But I never coded myself. So I was working with my co-founder on some other projects. And a few years ago, we noticed that there were more and more images and videos being generated globally. So it seemed like video, visual content was the way to go forward. And we thought, given our passion for building things, and our expertise in image recognition, why don't we try to build the technology to help and monetize this trend. And the way we decided to differentiate ourselves because there were plenty of other companies doing image recognition, software development, we decided to focus on solving one specific problem within image recognition that nobody ever really focused on solely. And that was building a technology that would be very robust in recognizing logos and marks inside the medicine videos. So we decided to focus on that we got pretty good, up to a point where it was extremely scalable and reliable for core applications of large enterprise clients. And when that started to happen, we decided to then start broadening with our suite of technologies. So today, we no longer just offer that core initial logo recognition technology. But we have a bunch of peripheral technologies as well like object and scene detection, text detection, visual search, a few more basic technologies, but when you combine them with the core logo recognition piece,

Dagmara Grzelska: What has been the most challenging thing for a while, you have been first introducing the product to the market. And I believe it was 2014. Right?

Luca Boschin: In a way, the answer is in the question, so you know, delivering a new product, you need to figure out who really needs it was the most urgent. For most clients, it would be nice to have rather than essential to have, although you know that in the long term, they would need to have it as well. So that is the initial hurdle is finding those that are ready and willing to invest in it straightaway at the beginning of it on the curb. Yeah, they would have been the main challenge.

Dagmara Grzelska: Okay. And because I believe like, based on my research on your platform, it has advanced rapidly since its launch and has got many additions. Could you

quickly tell me what kind of stages were the most important in the development of the product you're offering today?

Luca Boschin: For sure, the first two years where we just focus on R&D. No one says those first two years was just R&D specifically for the low-end market recognition that was very important technologically because it is set the basis for the way we work with our technology, which is a bit different from everybody else. So that was definitely an important time where you created a framework for how we see the technology. And then the two years after have also been very important, where we started setting up after those first two years of R&D. And we had to figure out what was the way that we could best interact with customers, how could we deliver the most value, you know, that learning curve was also very important to face for sure.

Dagmara Grzelska: Okay, so what kind of brands, what kind of companies have been your first clients? How has it developed since? What kind of targeted market you have?

Luca Boschin: Yeah, so I would explain it during the two phases, the R&D phase and then the actual technology phase. In the first phase, we build some small projects directly with brands, we used our technology for some campaigns or activations. But those were just industry tastes that we were conducting, to build the core logo recognition technology. As soon as we got to a point where it was scalable enough, we no longer work directly with brands, but rather with platforms to deliver services to brands. So that is the way that we started interacting with clients in that second phase of starting to actually sell, we would sell into technology platforms rather than the end brand client.

Dagmara Grzelska: Okay, and regarding your customers, are they at the moment more oriented on brand detection or more on marketing analytics?

Luca Boschin: There is a bunch of different sectors where the technology is used, I will tell you, perhaps the ones that were historically and going forward the most valuable. So

historically, one of the first places we started was social media monitoring. So that is a place to learn because it has to do with marketing, of course. So, in that space, our clients would be companies like Brandwatch, or Sprinkler, whose job is to tell brands, what sentiment the consumer has towards their products or competing products by looking at conversations that consumers have on social channels. Now today, most of those conversations will start with images and videos. So those platforms needed to keep the re-write those insights by finding the brands not in the text that people were writing on social channels but as they would appear inside the images of the content they shared. So that is one historical industry for us. That is where we started. And it is related to marketing. Then as we evolve, technology started to be used more and more in the spaces of counterfeit detection or copyright infringement. If you go on our website, you should find most of this stuff anyhow. But in that case, clients would be companies like eBay, the Marketplace, or red points, which is a well-known counterfeit detection platform. And the technology there would be used as the visual signal, among many other signals that would allow to autonomously detect if a product is being sold on the marketplace is real or fake. So, the visual signal would be for the logo or a bunch of other visual elements. And then the other signals are things like IP addresses and price of the item, there is a bunch of signals you can create. Then as we move forward, another space that we started to get more into is cybersecurity. And more specifically, things like anti-phishing, where I am not sure if you're aware of anti-phishing, and how it works. So basically, when somebody is trying to steal our username and passwords by bringing us to a web page that looks like a Google login page, but it is not a Google login page. And so in that space, we have clients like Mimecast, which again, is one of the leaders in the anti-phishing game, and it allows them now to look at phishing attacks from a human eye perspective. So, they use our technology to actually take a screenshot of which login page you land on so that the visual technology as a human would do locally understand if it's a real or a fake login page, and then create an alert if it looks like it's not the real logging page. So those were the kind of the major industries from the past and then going forward within a spectrum of different needs of marketing and brand safety.

Dagmara Grzelska: Okay, and can you tell me, how accurate is your product? Do you evaluate your analysis? How far can brands rely on your product?

Luca Boschini: Yeah, well, we are kind of the player on the market, which focuses on extremely high performance, both in terms of scale, as well as precision. Something to keep always in mind, you know, it's kind of easy to have good results in, you know, a low set of images or brands or things that you're looking at. The real challenge is to make things work with high precision and extremely high scalability. So large, the large amount of content, you're monitoring, and the large number of things you're looking for inside that content. So that's why most of our clients would be leaders in their industries because we do offer the best scalability and precision when it comes to things where the branding is central to deliver a solution. Now, the numbers, you know, if you would look at it scientifically, the numbers you look at it would be precision and recall numbers that allow you to measure both precision and scalability of the service. And for both of those, we are above 99%. So we're extremely high levels of precision.

Dagmara Grzelska: Has the accuracy of your analysis increased with the development of social media and rapid development of social media posts with brands/logos visible on said photos, or are those two separate things?

Luca Boschini: Yeah, there are always improvements that are made in technology. Now, as I was saying before, the first two years of R&D were very important because we set some very crucial roots in our technology. So and that's the first step that really got the high-level scalability and precision where we're just talking about. So improvements afterward would have been rather about creating additional efficiencies on the system, so that you could make it run even more efficiently, you could run even more content through it and do more things that those evolutions wouldn't have necessarily been in terms of performance in terms of was the result good but rather, how much more can we process at the level of, of precision and recall?

Dagmara Grzelska: So if I understand correctly, your platform analyzes only images that are publicly available, right?

Luca Boschin: We analyze the images that our clients own or have access to. So regarding large sources of images, we only deal with them. We're just a box where our clients put images inside. And then we give a result based on the images that they have. So it's their images that the owner in the examples of a company like brandwatch, they would, they would have a partnership with the social channels to have access to the public images, as you were saying, so we're just the data processor.

Dagmara Grzelska: There are no privacy concerns for you?

Luca Boschin: You know, in two ways, first, we're just a data processor and are just not an open API, but we work with our clients to understand exactly what they need to do and want to achieve. So we always make sure that the use of technology is the source of our goals.

Dagmara Grzelska: Okay, so do you identify any challenges that are connected strongly to using image recognition technology for market research or brand building purposes?

Luca Boschin: Well, for sure, one of the major challenges is that this is all new stuff. So you need to make sure to use the data in a way that makes sense because you can have access to a lot of data. But if you can't give sense to the data, there is no value for the data and nobody's going to care about the data. So definitely, that's something that is a challenge making sense of the data. And making sure that you use it in the right way and you connect. The second piece of challenge that you see often is that you want to solve something and you try to use or build internally some technology that kind of works. But again, it doesn't scale. And then you have lost a lot of resources and it works for nothing, so what do we always said to everybody, regardless if they work with us or somebody else, or they've been there internally, just to always make sure that whatever they're

working on, it's also going to stick and keep working at large scale. Otherwise, you're just wasting time and effort.

Dagmara Grzelska: Okay. So, in your opinion, what kind of competitive advantage can brands achieve by implementing your solution into their strategies?

Luca Boschin: Well, now this is more of an opinion, rather than my scientific view. Because we don't do marketing software, we do image recognition software that is then used by other parties to bid marketing software. But what is my opinion, what I can answer is that, first of all, you're missing out on the high percentage of the signal. For example, for Coca-Cola, only 20% of that content is actually written in the post that the remaining 80% is within the images. So already there, you're, you're throwing away a lot of data as a starting point. And then there is a bunch of things that you can do, as you were doing with traditional social media monitoring, such as identifying where and when your product was consumed, perhaps you figure out that it's consumed in places you were not thinking that it's being consumed and therefore, you may want to redirect your advertising budget towards that specific type of user. You can find things like co-branding opportunities because you can figure out with what are your products consumed because you can track for your own brands, but also your competing brands or other brands. So those three would be good examples of the value of this.

Dagmara Grzelska: If I understand correctly, you have been observing this market for such solutions for quite some time. So once again, it's a question about your opinion, how has the market for these AI marketing products, a brand new products changed developed since you have been observing it or since the launch of your product?

Luca Boschin: I think about AI in general. There are some more and more great tools out there that are used within social media monitoring. But even there, I think there's still a lot to do. And then within using AI specifically for looking inside visual content. I still think we're in the early beginnings. I know a few engineers who are really building

products that properly encapsulate Visua data as well. But it's still not the core thing. So I think we're still in the early days, most of the various steps include visual monitoring, and they will do it more and more. So there's still want to do more there when it comes to more broad AI use. Specifically for being able to better segment the data and making sense of the data, I would say that it's already a more evolved market. And there's a lot of I'm sure that most products they actually would be, would be based on some level of AI that smartly segments the data and makes sense of it.

Dagmara Grzelska: Okay. You have mentioned that Visua is a data processor. So, brands using it get some kind of information, but do you also offer data analytics products? Or plan to?

Luca Boschini: No, no, we're just the image recognition software, basically. So far, we don't work directly with brands, but we work with platforms.

Dagmara Grzelska: So if I understand correctly, your direct customers are platforms that then analyze the data for the customers, which are brands?

Luca Boschini: eBay in different sectors is a client of ours, Sprinklr for social media monitoring is a client of ours. They use our technology to analyze the data they have access to and make sense of it.

Dagmara Grzelska: What kind of market opportunities you see for products like yours? What kind of outlook? Can you forecast or tell me what's your idea for the future development of such products?

Luca Boschini: Sure, well, I keep in mind that our product wouldn't be a marketing product. So although there is a marketing angle to it, it's not our market size, it's not social listening market. It's still difficult for us to give market size or technology because, in a way, it is present in a few very different sectors. And it's still not clear, right, the one

which brings the most value, and we haven't invested yet significantly in a market that we think is the future. So we're still looking for the answer. So what we're looking for is more to make a market. It's difficult to evaluate. Let's be honest with ourselves, it could also be that nobody ever finds a market and there is no market. That could be as well, I find it highly unlikely given all the exciting opportunities and things we see out there. But that's still the case, it could be that there isn't a significant market participant.

Dagmara Grzelska: I also feel like, at the moment, the pressure to be innovative not only for marketers but basically every branch is really high. It seems kind of obvious that it will be you know, like the next step implementing AI everywhere.

Luca Boschini: For sure. Like, AI, it's no doubt. I was talking more specifically, our market for the specific company, but in terms of AI, like, no doubt that in the next 20 years AI is going to rule over a lot of markets.

Dagmara Grzelska: Those were all of my questions. I will analyze your responses and try to connect them to the theoretical framework. Thank you very much for your time. Thank you very much for talking to me. It was a pleasure to talk to you.

Luca Boschini: Awesome, thank you. Absolutely. And if you go through the staff you have any other question or if I didn't answer something properly or you're not sure, just, you know, reach out happy to help anytime.

Dagmara Grzelska: Thank you for much. Thank you.

Luca Boschini: Have a good day.

Dagmara Grzelska: Have a nice day too, bye-bye

Appendix 2. Transcript of the interview with the PR Officer of Heuritech - Mélanie Mollard

Dagmara Grzelska: Hi Melanie, thank you for joining me for this interview.

Mélanie Mollard: Thank you for asking me, I am happy to help with your thesis.

Dagmara Grzelska: What was the initial thought behind the Heuritech platform? How did two AI scientists come up with the idea to create a platform which combines AI and fashion?

Mélanie Mollard: Upon completion of their PhDs in Artificial Intelligence in 2013, Tony Pinville and Charles Ollion co-founded Heuritech together. They developed an image recognition technology based on machine learning, a branch of AI, which would scan images and pinpoint particular attributes from each in order to determine certain patterns and trends. Initially, they weren't sure in which direction to take their idea, but following a serendipitous meeting with LVMH in Paris, the pair decided to apply their technology to the fashion industry. This AI-based image recognition technology turned out to be the perfect tool for scanning images shared on social media in order to detect fashion trends and forecast their behavior through predictive analytics.

Dagmara Grzelska: What has been the single, most challenging thing the company faced while introducing a highly innovative, data-driven product in 2013?

Mélanie Mollard: At the time, the fashion industry wasn't quite ready for artificial intelligence. It felt too futuristic and even threatening to the creative process. Using data to make decisions on design and assortment felt like stepping on the toes of designers and merchandisers for many brands. But with time, and deep shifts in the industry, fashion is much more accepting of digital transformation than it was at the start of Heuritech.

Dagmara Grzelska: How has the platform advanced since its launch? How has the market for AI marketing products changed since Heuritech has been first introduced?

Mélanie Mollard: The nature of machine learning is that it becomes more “intelligent” with time: it is a type of artificial intelligence that allows for self-learning from data input, which the machine then applies to continue to learn without human intervention. In this way, Heuritech’s trend forecasting technology is like fine wine -- the more images and videos the machine consumes, the more intelligent it becomes, understanding more and more attributes to better predict fashion trends. Fabrics from vinyl to teddy, colors from periwinkle to chartreuse, and silhouettes from A-line necklines to bishop sleeves, become easier for the machine to recognize. Today, Heuritech’s trend forecasting platform offers two functions: market trends and product performance. Market trends are attributes such as the ones listed above, so anything from colors to patterns to textures, and more. Product performance is the behavior of products themselves, so a particular bag from a brand, for instance. Regarding the market, it’s a much more welcome environment to AI than it was several years ago. The fashion industry is open to new technologies and AI, which has largely been accelerated by the pandemic over the past year. Brands are realizing that leveraging predictive analytics, in particular, is a major tool to finding solutions in adapting to evolving consumer desires and the industry landscape.

Dagmara Grzelska: What kind of brands use Heuritech? What is the ultimate targeted market?

Mélanie Mollard: Heuritech’s clients reside in three main industries: fashion, luxury, and sportswear. They include Dior, Havaianas, Louis Vuitton, Moncler, and AliExpress. There is no ultimate targeted market: Heuritech forecast trends for brands with varying consumer segments in varying geographies, from trendy 20-something-year-old women in China to 40-something-year-old men in Europe.

Dagmara Grzelska: What kind of competitive advantage can brands in your opinion achieve by implementing data-driven tools into their strategic marketing?

Mélanie Mollard: Indeed, one of Heuritech's three personae are brands' marketing teams, who use our quantitative trend insights to determine major marketing decisions involved in collection planning. Consumer segmentation, geography, and optimal launch season and month are things Heuritech takes into account when delivering trend forecasts, which marketing teams can use to best market their brand's next collection. This allows brands to increase sell-through, and in turn, increase profitability and reduce overstock and ultimate waste from season to season.

Dagmara Grzelska: Heuritech only uses public social media content for analytics purposes, however, have you ever faced any privacy concerns regarding your product? What challenges do you identify in using image recognition technology for market research purposes?

Mélanie Mollard: As stated, Heuritech's image recognition technology only scans images from public accounts on social media. Thanks to the terms of service of these platforms, we have never had any friction regarding privacy concerns.

Dagmara Grzelska: How accurate is the platform? How far can fashion brands rely on Heuritech forecasts? How do you evaluate your forecasts? Has the rapid development of social media usage enhanced the accuracy of your forecasts?

Mélanie Mollard: Heuritech predicts trends with 90% accuracy up to 1 year in advance, allowing brands to plan collections several seasons ahead, as is the usual way in the fashion industry. What makes Heuritech's trend forecasts so powerful is the collaboration between our data and fashion teams to back each trend forecast with quantitative and qualitative insights.

1. Fashion Team: Draws from a number of sources, including social media, catwalks, press, client requests, and more. They've created over 2000 attributes, or "tags," based on their fashion expertise and client expectations, in order to provide Heuritech's data science teams with a detailed and exhaustive architecture for each category covered (tops, pants, skirts, dresses, shoes, etc.). The modules can then be trained -- in other words, the machine learns to recognize any fashion attribute it is presented with. The fashion team has several main axes:
 - Building consumer panels for each geography and gender representative of the fashion influencers of the industry
 - Building exhaustive architecture of clothing typologies for each category of products aligned with clients' collection organization and market offer
 - Checking alignment of predictions with market reality
 - Infusing fashion expertise into data insights
2. Product Team: Brings together different fields of expertise to translate the power of our AI data into a usable product for clients. They understand the client and create a roadmap that takes into account not only clients' priorities but the team's ability to deliver new product features. Implementation involves different skills in the product team, such as data science, designers, and software engineers.
3. R&D Team: Creates the artificial intelligence technology that allows Heuritech to explore fashion trends and products. Their goal is to reliably analyze millions of images from social media to have a realistic and data-driven knowledge of the state of fashion today and in the past. For each image they see on social media, the team finds all the fashion items in it, and analyzes each of them very finely. For example, for a top, the team wants to know its type, the kind of sleeve it has, how it closes, its color, textures, and patterns, and more. To achieve this goal, the team uses deep learning. However, successfully applying research results to real-world applications is far from being easy, so the R&D team keeps up with the scientific literature, tries promising methods, compares them, and adapts them

to the singular problems faced at Heuritech. All this to be able to predict everything very accurately.

4. **Delivery Team:** Ensures that Heuritech's technology identifies the right element in each image to be able to predict the trend on social media data. To do so, they organize the trends catalog's creation & trends recognition process. As they analyze several million images per day, the algorithm requires a huge set of examples to be trained before being mature enough to predict the trends. This is why Heuritech has a specific process called labellisation - Heuritech works with a team of operators to manually "labelize" images to prepare positive and negative examples of the trend based on definitions the delivery team has seen before. Once the algorithms are trained with the data, the last step is to verify that the trends are accurately predicted. Once the team gets the green light, they create a selection of trends to be plugged into the product.
5. **Data Science Team:** Analyzes thousands of tags (or attributes) on millions of images to determine the evolution of fashion trends through time. This team uses descriptive analytics, looks at exogenous signals, and combines prediction models to do so. Ultimately, they deduce different aspects that they quantify thanks to Heuritech's metrics, which combined give a complete trend diagnosis.

This is how Heuritech predicts trends with accuracy.

Dagmara Grzelska: This is all I wanted to ask. Once again huge thank you for finding time to help me with my research project.

Mélanie Mollard: Thank you for having me, it was a pleasure. Have a nice day, bye!

Dagmara Grzelska: Have a nice day too, bye!